

CLAIMS

What is claimed is:

1. A medical electrical lead to provide electrical stimulation to a heart, comprising:  
an elongated lead body having a proximal portion and a distal portion;  
a first pace/sense electrode coupled to the distal portion adapted to provide stimulation to a left chamber of the heart;  
a coil electrode coupled to the distal portion proximal to the first pace/sense electrode adapted to provide cardioversion/defibrillation stimulation; and  
a second pace/sense electrode coupled to the distal portion and being proximal to the coil electrode.
2. The lead of Claim 1, and further including a connector coupled to the proximal portion to allow either the first or the second pace/sense electrode to be selected as a cathode for delivery of relatively low-voltage stimulation to the left chamber of the heart.
3. The lead of Claim 2, wherein the connector is adapted to allow the other of either the first or the second pace/sense electrode to be electrically coupled to the coil electrode.
4. The lead of Claim 1, wherein the elongate lead body provides at least one lumen extending at least a portion of the length of the elongate lead body.
5. The lead of Claim 4, wherein the at least one lumen includes a lumen adjacent to an exterior surface of the lead body.
6. The lead of Claim 5, wherein the lumen adjacent to the exterior surface of the lead body is formed of a collapsible tube.
7. The lead of Claim 5, wherein the lumen adjacent to the exterior surface of the lead body is closed at the distal end.

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-17-

8. The lead of Claim 8, and further including a stop member proximate the distal end of the lumen adjacent to the exterior surface of the lead body.
9. The lead of Claim 1, wherein the second pace/sense electrode is a coil electrode.
10. The lead of Claim 1, wherein the first pace/sense electrode is a tip electrode coupled to the distal tip of the elongate lead body.
12. The lead of Claim 10, wherein the tip electrode includes a tapered tip.
13. The lead of Claim 1, wherein at least one of the first and the second pace/sense electrodes includes a zone protruding from the surface of the first and the second pace/sense electrodes to couple to tissue.
14. The lead of Claim 13, wherein the zone is a protruding annular ring.
15. The lead of Claim 1, wherein the elongate lead body has at least one portion of an exterior surface including a porous Polytetrafluoroethylene (PTFE) material.
16. The lead of Claim 15, wherein the at least one portion is located proximate to any of the first or the second pace/sense electrodes or the coil electrode.
17. A system for providing electrical stimulation to a heart, comprising:  
an elongated lead body having a proximal portion and a distal portion;  
a first pace/sense electrode coupled to the distal portion adapted to pace a left chamber of the heart;  
a coil electrode coupled to the distal portion proximal to the first pace/sense electrode adapted to provide cardioversion/defibrillation stimulation to the heart; and  
a second pace/sense electrode coupled to the distal portion and positioned proximal to the coil electrode.

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-18-

18. The system of Claim 17, and further including a connector coupled to the proximal portion to allow either the first or the second pace/sense electrode to be selected as a cathode to deliver relatively low-voltage electrical stimulation to the left chamber of the heart.
19. The system of Claim 18, wherein the connector is adapted to allow the other of either the first or the second pace/sense electrode to be electrically coupled to the coil electrode.
20. The system of Claim 19, and further including an implantable medical device (IMD) to electrically couple to at least two electrodes selected from the group consisting of the first and the second pace/sense electrodes and the coil electrode.
21. The system of Claim 20, wherein the IMD includes a select circuit to select either the first or the second pace/sense electrode as a cathode for delivery of the relatively low-voltage electrical stimulation.
22. The system of Claim 21, wherein the select circuit includes a circuit to select the other of the first or the second pace/sense electrode as an anode for delivery of the relatively low-voltage electrical stimulation.
23. The system of Claim 22, wherein the select circuit includes a circuit to electrically couple the other of the first or the second pace/sense electrode to the coil electrode. .
24. The system of Claim 19, and further including an adapter to couple to the connector to select either the first or the second pace/sense electrode as a cathode for delivery of the relatively low-voltage electrical stimulation.
25. The system of Claim 24, wherein the adapter is adapted to select the other of the first or the second pace/sense electrode as an anode for delivery of the relatively low-voltage electrical stimulation.

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-19-

26. The system of Claim 25, wherein the adapter is adapted to electrically couple the other of the first or the second pace/sense electrode to the coil electrode.
27. The system of Claim 25, wherein the adapter includes a standard IS-1 connector.
28. The system of Claim 26, wherein the adapter includes a standard DF-1 connector.
29. The system of Claim 24, wherein the adapter includes a roll-back sleeve.
30. The system of Claim 24, wherein the connector includes at least three connection members adapted to be received by the adapter.
31. The system of Claim 30, wherein each of the at least three connection members are spaced substantially equidistantly from the other of the at least three connection members.
32. The system of Claim 30, wherein the adapter includes a first port to couple to two of the at least three connection members, and a second port to couple to one of the at least three connection members.
33. The system of Claim 32, wherein the adapter includes a lockout member to prevent a predetermined two of the at least three connection members from coupling to the first port.
34. A method of delivering electrical stimulation to a heart, comprising the steps of:  
a.) delivering a lead to a branch vein of the coronary sinus, wherein the lead comprises:  
an elongated lead body having a proximal portion and a distal portion;  
a first pace/sense electrode coupled to the distal portion; and  
a second pace/sense electrode coupled to the distal portion and positioned proximal to the first pace/sense electrode;  
b.) selecting one of the first or the second pace/sense electrode as a cathode and the other of the first or the second pace/sense electrode as the anode; and

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-20-

c.) delivering relatively low-voltage electrical stimulation between the cathode and the anode to a left chamber of the heart.

35. The method of Claim 34, wherein the lead further comprises a coil electrode coupled to the distal portion and positioned proximal the first pace/sense electrode and distal to the second pace/sense electrode, and further comprising:

electrically coupling the other of the first or the second pace/sense electrode to the coil electrode prior to step c.).

36. The method of Claim 35, and further including delivering relatively high-voltage electrical stimulation via the coil electrode.

37. The method of Claim 36, wherein the step of delivering relatively high-voltage electrical stimulation via the coil electrode is performed after electrically coupling the other of the first or the second pace/sense electrode to the coil electrode.

38. The method of Claim 34, and further including coupling an implantable medical device (IMD) to the lead, wherein the IMD includes a select circuit, and wherein step b.) includes configuring the select circuit.

39. The method of Claim 32, wherein step b.) includes coupling the lead to an adapter.

40. The method of Claim 34, wherein the lead includes a lumen, and wherein step a.) includes guiding the lead with a delivery device positioned within the lumen.

41. The method of Claim 40, wherein the lumen is a collapsible tube adjacent to an exterior surface of the lead.

42. The method of Claim 41, wherein the tube is formed of porous PTFE material.

43. The method of Claim 40, wherein the delivery device is a stylet.

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-21-

44. The method of Claim 40, wherein the delivery device is a guidewire.

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